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10/534,459	05/11/2005	Hiroshi Kurakata	4918-0102PUS1	6940
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EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
10/09/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/534,459

Applicant(s)

KURAKATA, HIROSHI

Examiner

ANCA EOFF

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/15/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 6, 8-12 and 14-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-12, 14, 15 and 20-23 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8, 9, 16-19 and 24 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 07/21/2009.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-3, 5-6, 8-12 and 14-25 are pending in the application. Claims 4, 7 and 13 have been canceled.
2. The foreign priority document JP 2002-347224, filed on November 29, 2002 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

Claim Rejections - 35 USC § 102 and 35 USC § 103

3. The following is a quotation of the appropriate paragraph of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Akaiwa et al. (US Patent 5,721,990).

Claim 8 is a "product-by-process" claims. Even though the claim is directed to a process, the patentability is given by the product itself.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of

production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (MPEP 2113)

With regard to claims 8-9, Akaiwa et al. disclose an image forming apparatus comprising a transparent pattern area (column 3, line 32), which is formed by a transparent resist (column 3, lines 51-52).

The transparent pattern area of Akaiwa et al. is identical or, in the alternative, renders obvious the transparent resin pattern film of the instant application.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

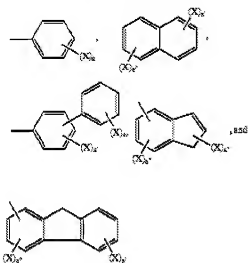
6. Claims 1-3, 5-6, 16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayaraman et al. (US Patent 6,451,499) in view of Imai et al. (US Pg-Pub 2002/0012880).

With regard to claims 1 and 2, Jayaraman et al. disclose a polymer comprising one or more of monomers of formulas (I) (column 3, lines 18-20):



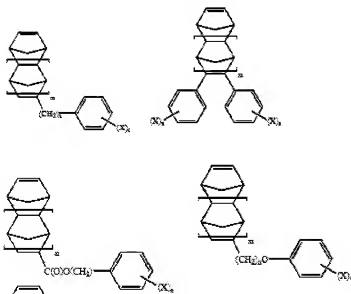
Art Unit: 1795

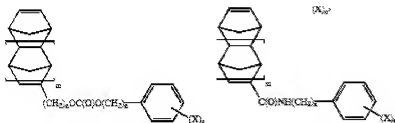
(I) (monomer of formula (I) in column 3, lines 30-40), wherein at least one of R^1 to R^4 comprises a group selected from:



(column 3, line 50-column 4, line 10).

The monomers of formula (I) may be represented by the formulas (II):





X may be a group $-OR^{14}$ (column 4, line 1), wherein R^{14} may be hydrogen (column 4, line 14).

Jayaraman et al. specifically teach that a positive resist uses polymers comprising units (I) with pendant hydroxyl substituted aromatic groups (column 19, lines 55-57).

Jayaraman et al. do not specifically teach a polymer comprising units (I) with acidic phenolic hydroxyl groups. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain such a polymer, based on Jayaraman's teaching that a polymer having units (I) with pendant hydroxyl substituted aromatic groups is preferred for positive resists.

Jayaraman et al. further teach that a way to polymerize the monomers of the instant application is by ring-opening metathesis polymerization (ROMP) followed by hydrogenation (column 11, lines 20-23).

A polymer comprising monomers of formula (II), wherein X is a hydroxyl group ($-OH$) is equivalent to the alicyclic olefin soluble in alkali, wherein the alicyclic resin is a ring-opening polymer having a phenolic hydroxyl acidic group.

The limitation that the alicyclic resin "is obtained by ring-opening polymerization of a polymerizable monomer comprising an alicyclic olefin monomer having an acidic

group in a presence of a catalyst comprising ruthenium, followed by hydrogenating an obtained polymer, wherein the catalyst comprising ruthenium is a catalyst comprising as main component an organoruthenium compound in which a neutral electron-donating ligand is co-ordinated" is a product-by-process limitation.

While the claim is directed to the process of obtaining the alicyclic resin, the patentability is determined by the alicyclic resin itself. The resin of Jayaraman et al. is a ring-opening polymerization alicyclic resin with an acidic group which is identical or, in the alternative, renders obvious the resin (A) of the instant application.

Jayaraman et al. teach that polymers with units (I) having repeating units with hydroxyl substituted aromatic groups (equivalent to the resin (A) of the instant application) may be included in positive resists (column 19, lines 54-57) but fail to teach all the components of the positive resist of the instant application.

Imai et al. disclose a positive sensitive resin composition comprising a base polymer, an ether bond-containing unsaturated compound and an acid-generating agent (abstract). The base polymer comprises units with pendant hydroxyl substituted aromatic groups (see formula (1) in par.0019).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the polymer having repeating units with hydroxyl substituted aromatic groups of Jayaraman et al. in the positive resist composition of Imai et al., with a reasonable expectation of success.

The ether-bond containing olefinic unsaturated compound of Imai et al. acts as a crosslinker (see par.0133) and it is equivalent to crosslinking agent (C) of the instant application (see page 23, lines 7-14 of the specification).

Imai et al. further teach that the positive sensitive resin composition may further comprise an acid generator (see abstract, par.0097), which is equivalent to the compound (B) of the instant application.

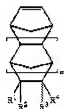
Imai et al. further teach that the positive sensitive resin composition may comprise a solvent (par.0080), equivalent to the compound (D) of the instant application.

Claims 3, 5 and 6 are directed to the process of obtaining the alicyclic olefin resin (A) of claim 1. The limitations of claims 3, 5 and 6 do not add any patentable weight to the resin (A) of claim 1.

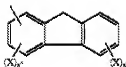
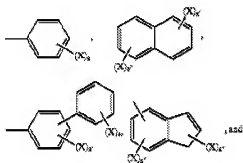
The resin of Jayaraman et al. is a ring-opening polymerization alicyclic resin with an acidic group which is identical or, in the alternative, renders obvious the resin (A) of the instant application.

With regard to claim 16, Imai et al. teach that the positive resist may comprise an acid generator such as a naphthoquinone diazide sulfonate (par.0097) which is equivalent to the quinone diazide sulfonic acid ester capable of forming a positive pattern of the instant application (see page 22, lines 12-13 of the specification).

With regard to claim 24, Jayaraman et al. disclose a polymer comprising one or more of monomers of formulas (I) (column 3, lines 18-20):

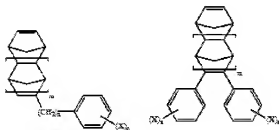


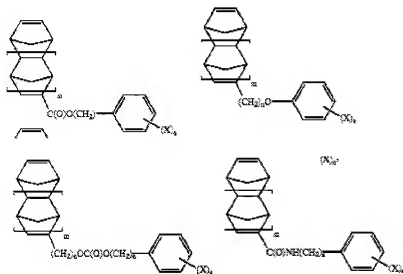
(I) (monomer of formula (I) in column 3, lines 30-40), wherein at least one of R¹ to R⁴ comprises a group selected from:



(column 3, line 50-column 4, line 10).

The monomers of formula (I) may be represented by the formulas (II):





X may be a group $-OR^{14}$ (column 4, line 1), wherein R^{14} may be hydrogen (column 4, line 14).

Jayaraman et al. specifically teach that a positive resist uses polymers comprising units (I) with pendant hydroxyl substituted aromatic groups (column 19, lines 55-57).

Jayaraman et al. do not specifically teach a polymer comprising units (I) with acidic phenolic hydroxyl groups. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain such a polymer, based on Jayaraman's teaching that a polymer having units (I) comprising pendant hydroxyl substituted aromatic groups is preferred for positive resists.

Jayaraman et al. further teach that a way to polymerize the monomers of the instant application is by ring-opening metathesis polymerization (ROMP) followed by hydrogenation (column 11, lines 20-23).

A polymer comprising the monomers of formula (II), wherein X is a hydroxyl group (-OH) is equivalent to the alicyclic olefin soluble in alkali, wherein the alicyclic resin is a ring-opening polymer having a phenolic hydroxyl acidic group.

The limitation that the alicyclic resin "is obtained by ring-opening polymerization of a polymerizable monomer comprising an alicyclic olefin monomer having an acidic group in a presence of a catalyst comprising ruthenium, followed by hydrogenating an obtained polymer, wherein the catalyst comprising ruthenium is a catalyst comprising as main component an organoruthenium compound in which a neutral electron-donating ligand is co-ordinated" is a product-by-process limitation.

While the claim is directed to the process of obtaining the alicyclic resin, the patentability is determined by the alicyclic resin itself. The resin of Jayaraman et al. is a ring-opening polymerization alicyclic resin with an acidic group which is identical or, in the alternative, renders obvious the resin (A) of the instant application.

Jayaraman et al. teach that polymers with units (I) having repeating units with hydroxyl substituted aromatic groups (equivalent to the resin (A) of the instant application) may be included in positive resists (column 19, lines 54-57) but fail to teach all the components of the positive resist of the instant application.

Imai et al. disclose a positive sensitive resin composition comprising a base polymer, an ether bond-containing unsaturated compound and an acid-generating agent (abstract). The base polymer comprises units with pendant hydroxyl substituted aromatic groups (see formula (1) in par.0019).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the polymer having repeating units with hydroxyl substituted aromatic groups of Jayaraman et al. in the positive resist composition of Imai et al., with a reasonable expectation of success.

The ether-bond containing olefinic unsaturated compound of Imai et al. acts as a crosslinker (see par.0133) and it is equivalent to the crosslinking agent (C) of the instant application (see page 23, lines 7-14 of the specification).

Imai et al. further teach that the positive sensitive resin composition may further comprise an acid generator (see abstract, par.0097), which is equivalent to the compound (B) of the instant application.

Imai et al. further teach that the positive sensitive resin composition may comprise a solvent (par.0080), equivalent to the compound (D) of the instant application.

Imai et al. further disclose that the positive sensitive resin composition forms a pattern (par.0130), which is equivalent to the resin film of a positive pattern of the instant application.

The limitation "wherein said resin film formed of said resin composition is cured by heating (post baking) after the positive pattern of the resin film is developed" is an intended use and adds no patentable weight to the claim.

Therefore, the pattern of Jayaraman modified by Imai is equivalent to the resin film of a positive pattern of the instant application.

7. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayaraman et al. (US Patent 6,451,499) in view of Imai et al. (US Pg-Pub 2002/0012880) as applied to claim 16 and in further view of Suwa et al. (US Patent 6,692,887).

With regard to claims 17-19, Jayaraman modified by Imai teach the resist composition of claim 16 (see paragraph 6 above), wherein the photoacid generator may be a naphthoquinone diazide sulfonate (see Imai et al., par.0097). However, Jayaraman and Imai fail to teach the acid-generating agent of the instant application.

Suwa et al. disclose a radiation-sensitive resin compositions comprising a resin with an alicyclic skeleton in the backbone (abstract). The radiation-sensitive resin may comprise a photoacid generating agent, such 1,2-naphthoquinonediazide-5-sulfonic acid ester of 2,3,4,4'-tetrahydroxybenzophenone (column 20, lines 4-5).

As Suwa et al. shows that that the 1,2-naphthoquinonediazide-5-sulfonic acid ester of 2,3,4,4'-tetrahydroxybenzophenone is used as photoacid generating compound in radiation sensitive composition, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the 1,2-naphthoquinonediazide-5-sulfonic acid ester of 2,3,4,4'-tetrahydroxybenzophenone of Suwa et al. in the resist composition of Jayaraman modified by Imai, with a reasonable expectation of success.

The 1,2-naphthoquinonediazide-5-sulfonic acid ester of 2,3,4,4'-tetrahydroxybenzophenone is equivalent to the quinonediazidesulfonic acid ester obtained from ,2-naphthoquinonediazide-5-sulfonic acid chloride and 2,3,4,4'-tetrahydroxybenzophenone of the instant application.

Allowable Subject Matter

8. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Imai et al. (US Pg-Pub 2002/0012880) do not teach the crosslinking agents of claim 25.

9. Claims 10-12, 14, 15 and 20-23 are allowed.

Jayaraman et al. (US Patent 6,451,499) do not teach that an alicyclic resin with an acid group may be obtained by ring-opening polymerization of a polymerizable monomer comprising an alicyclic olefin monomer with an acidic group in presence of a catalyst comprising ruthenium followed by hydrogenating the obtained polymer.

There is no prior art teaching that would motivate one of ordinary skill in the art at the time of the invention to modify the teachings of Jayaraman and obtain the process of claim 10.

Response to Arguments

10. Applicant's arguments filed on June 15, 2009 have been fully considered but they are not persuasive.

On pages 9-10 of the Remarks, the applicant is arguing the rejection of claims 8-9 under 35 USC 102(b)/103(a) over Akaiwa et al. (US Patent 5,721,990).

The applicant argues that Akaiwa et al. teach a transparent photoresist comprising a resin, such as methacrylic resin, polycarbonate resin or ABS resin. In

contrast, claim 8 of the instant application recites a transparent resin pattern film formed in accordance to claim 10 so the transparent film defined in claim 8 should have a particular composition inherently owned by a product obtained by the process of claim 10.

The examiner would like to show that claim 8 recites "A transparent resin pattern film formed in accordance with a process described in claim 10". Claim 8 is a product-by-process claim and the patentability of the claim is given by the product (a transparent resin pattern film).

Claim 8 does not recite the components of the film so these components are not considered for the examination of claim 8.

The applicant is requesting the examiner to clarify why the transparent resin pattern film formed in accordance with the process of claim 10 is the same or obvious over the resist of Akaiwa et al. The examiner showed this equivalence in paragraph 6 of the previous Office Action: the transparent resin pattern film of the instant application is identical or obvious over a transparent pattern area formed by a transparent photoresist of Akaiwa et al.

The fact that the transparent resin pattern film is formed by the method of claim 10 is not giving any patentable weight to the claim (see MPEP 2113).

The applicant further shows that the advantages of the pattern film obtained by the process of claim 10 is clearly shown from the results of Examples 1-4 and Comparative Examples 1-3. However, the examples do not compare the pattern film of

claim 1 with the transparent pattern area of Akaiwa et al. so the rejection is not overcome.

11. The applicant's arguments, see pages of the Remarks filed on June 15, 2009, with respect to:

- the rejection of claims 1-3, 5-6 and 16 under 35 U.S.C. 103(a) over Jayaraman et al. (US Patent 6,451,499) in view of Tsunogae et al. (WO 00/73366, wherein the citations are from the English equivalent document US Patent 6,486,264) and in further view of Imai et al. (US Pg-Pub 2002/0012880);

- rejection of claims 17-19 under 35 U.S.C. 103(a) over Jayaraman et al. (US Patent 6,451,499) in view of Tsunogae et al. (WO 00/73366, wherein the citations are from the English equivalent document US Patent 6,486,264) and Imai et al. (US Pg-Pub 2002/0012880) as applied to claim 16 and in further view of Suwa et al. (US Patent 6,692,887).

- rejection of claims 10-15, 20 and 24 under 35 U.S.C. 103(a) over Jayaraman et al. (US Patent 6,451,499) in view of Tsunogae et al. (WO 00/73366, wherein the citations are from the English equivalent document US Patent 6,486,264) and in further view of Imai et al. (US Pg-Pub 2002/0012880) and Eilbeck (US Patent 6,790,582).

- the rejection of claims 21-23 are rejected under 35 U.S.C. 103(a) over Jayaraman et al. (US Patent 6,451,499) in view of Tsunogae et al. (WO 00/73366, wherein the citations are from the English equivalent document US Patent 6,486,264), Imai et al. (US Pg-Pub 2002/0012880) and Eilbeck (US patent 6,790,582) as applied to

claim 20 above and in further view of Suwa et al. (US Patent 6,692,887) have been fully considered and are persuasive.

The above-mentioned rejections have been withdrawn.

However, new grounds of rejection for claims 1-3, 5-6, 16-19 and 24 are shown above in paragraphs 5-7 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

Art Unit: 1795

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795